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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/770,725	01/26/2001	Li Yang	791_130	6015

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EXAMINER

CREPEAU, JONATHAN

ART UNIT PAPER NUMBER

1746

DATE MAILED: 07/15/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/770,725

Applicant(s)

YANG ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 12. 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on March 6, 2003 and May 6, 2003 have been entered. Claims 1-16 and newly added claim 17 are addressed herein. Claims 1-16 remain rejected under 35 USC §102 and §103 for the reasons of record, and claim 17 is also rejected for these reasons. Additionally, claim 17 is rejected under 35 USC §112, first paragraph. This action is non-final.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 17 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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Claim 17 recites that the concentration of water released from the electrodes “determined using Karl Fischer’s method after sealing the battery, or after completion of the assembly of the battery” is below a specified level. However, it is the Examiner’s position that the application as originally filed does not support the recitation that the water content of the electrodes is measured *after* the battery is sealed or assembled. As described in the instant specification on page 4, line 16 to page 5, line 2, the goal of the present invention is to control the water content in an electrode unit which is to be packed in a battery. The passage also states that water moves from the electrodes to the electrolyte after assembly of the battery, and it is the subsequent accumulation of water in the electrolyte which causes deterioration in battery properties. Accordingly, a person skilled in the art would conclude from this disclosure that the critical variable in the invention is how much water the electrode unit *initially contains and is subsequently capable of donating* to the electrolyte after being packed in the battery. Therefore, an artisan would recognize that the relevant measurement of water content would have to be performed *before* the battery is assembled. If the measurement were to be performed after battery assembly, the only variable being measured would be the amount of residual water left on the electrode unit after it has donated water to the electrolyte solution. Such a measurement would not be relevant or meaningful to the purpose of Applicant’s invention, which is to limit to a threshold value the water that the electrode unit is capable of donating to the electrolytic solution. Accordingly, the recitation in claim 17 that the water content is measured after assembly of the battery is not believed to be properly supported by the originally-filed application and is thus constitutes new matter.

Claim Rejections - 35 USC § 102

4. Claims 1, 2, 12, 13, and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Watanabe et al (U.S. Patent 6,083,644). Regarding claims 1 and 17, the reference is directed to a nonaqueous lithium secondary battery comprising a positive and negative electrode laminated through a separator (see abstract and Figure 1). Regarding claims 1, 2, and 17, the battery contains an electrolyte comprising lithium hexafluorophosphate (see col. 12, line 46). Regarding claims 1 and 17, as disclosed in column 14, lines 48-52, the positive electrode mixture and the negative electrode mixture both have moisture contents of 50 ppm or less. Therefore, the moisture content of both electrodes would inherently be lower than 5,000 ppm in case of heating the electrodes at 25 to 200°C, and lower than 1,500 ppm in case of heating at 200°C to 300°C, as recited in claims 1 and 17. Regarding claim 17, the moisture content would inherently be within these ranges even if the measurements were made after the battery was assembled or sealed. Regarding claims 12 and 13, which recite that the battery is used in an electric automobile, these claims do not have to be accorded patentable weight because they recite an intended use and do not further limit the structure of the battery (MPEP §2114).

Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

5. Claims 3, 4, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al in view of Takami et al (U.S. Patent 6,350,544).

Watanabe et al. is applied to claims 1, 2, 12, 13, and 17 for the reasons stated above.

Watanabe et al. do not expressly teach that the positive electrode material is a lithium manganese oxide having a cubic spinel structure (e.g., LiMn_2O_4).

In column 4, lines 48 and 49, Takami et al. teach a lithium battery comprising a positive electrode material comprising LiMn_2O_4 .

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Takami et al. would motivate the artisan to use LiMn_2O_4 as the positive electrode material of Watanabe et al. In the cited passage, Takami et al. teach that LiMn_2O_4 is "preferable in view of obtaining a high voltage." Accordingly, the artisan would be motivated to use LiMn_2O_4 as the positive electrode material of Watanabe et al.

Regarding claims 14 and 15, these claims are not accorded patentable weight for the reasons set forth above.

6. Claims 5-7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. in view of Takami et al. as applied to claims 3, 4, 14, and 15 above, and further in view of Omaru et al (U.S. Patent 6,277,522).

Watanabe et al. do not expressly teach that the negative electrode active material is a graphitized carbon fiber.

In column 8, lines 13-21, Omaru et al. teach a negative electrode comprising a graphitized carbon fiber.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Omaru et al. would motivate the artisan to use graphitized carbon fiber as the negative electrode material of Watanabe et al. In the cited passage, Takami et al. teach that graphitized fiber can be realized which has “strength tolerable to expansion/contraction at the time of charge/discharge and high capacity.” Accordingly, the artisan would be motivated to use graphitized carbon fiber as the negative electrode material of Watanabe et al.

7. Claims 1-4, 8-15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al (U.S. Patent 6,235,426) in view of Watanabe et al., in further view of Takami et al.

Regarding claims 1 and 17, Yanai et al. is directed to a nonaqueous lithium secondary battery comprising a positive and negative electrode laminated through a separator (see abstract and Figure 1). Regarding claims 1, 2, and 17, the battery contains an electrolyte comprising lithium hexafluorophosphate (see col. 8, line 42). Regarding claims 8-11, the battery has a capacity of 3.5 Ah (see Table 1).

Yanai et al. do not expressly teach the water content of each electrode (as recited in claims 1 and 17), or that the positive electrode material is a lithium manganese oxide having a cubic spinel structure (e.g., LiMn_2O_4) (claims 3, 4).

As set forth above, in column 4, lines 48 and 49, Takami et al. teach a lithium battery comprising a positive electrode material comprising LiMn_2O_4 .

As set forth above, Watanabe et al. teach in column 14, lines 48-52 that a positive electrode mixture and a negative electrode mixture both have moisture contents of 50 ppm or less.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Takami et al. would motivate the artisan to use LiMn_2O_4 as the positive electrode material of Yanai et al. In the cited passage, Takami et al. teach that LiMn_2O_4 is “preferable in view of obtaining a high voltage.” Accordingly, the artisan would be motivated to use LiMn_2O_4 as the positive electrode material of Yanai et al.

Furthermore, the disclosure of Watanabe et al. would motivate the artisan to use electrodes having a moisture content of less than 50 ppm in the battery of Yanai et al. In column 14, line 49 et seq., Watanabe et al. teach that it is “preferred...from the point of cycle property” that the electrodes have such a low moisture content. Additionally, the combined moisture content of the electrodes would inherently be lower than 5,000 ppm in case of heating the electrodes at 25 to 200°C, and lower than 1,500 ppm in case of heating at 200°C to 300°C, as recited in claims 1 and 17.

Regarding claims 12-15, these claims are not accorded patentable weight for the reasons set forth above.

Response to Arguments

8. Applicant's arguments filed March 6, 2003 and May 6, 2003, have been fully considered but they are not persuasive. Applicants assert that the moisture contents of the mixtures of Watanabe are those prior to the electrodes being incorporated in a battery and prior to coming into contact with an electrolyte, and thus do not inherently satisfy the ranges recited in claim 1, which should be interpreted as requiring the specified electrode moisture contents *after* incorporation into a battery. First, it is the Examiner's position that such interpretation of the instant claims is not proper or permissible, for the reasons set forth in the §112, first paragraph rejection above. Additionally, as stated in the Advisory Action of March 20, 2003, even if the instant claims are interpreted as requiring certain electrode moisture contents after incorporation into a battery, it is still believed that Watanabe is anticipatory of this subject matter. As noted above, Watanabe requires water contents of 50 ppm or less in each electrode and in the electrolyte. Therefore, even if water is adsorbed onto the electrodes from the electrolyte while inside the battery, the water content of the electrodes still would not exceed 50 ppm at any time. Therefore, the disclosure of Watanabe is still considered to be anticipatory of claim 1. Furthermore, as noted above, the instant specification discloses that upon incorporation into the battery, water is released from the electrodes into the electrolyte and not vice verse. See page 3, lines 12-14; page 4, lines 16-21; and page 14, lines 3-17. Applicants cite page 5, lines 7-11 as disclosing that water can be "adsorbed" on the electrodes from the electrolyte, but this passage actually teaches that water is released from the electrodes into the electrolyte. Therefore, the instant specification does not indicate that the electrodes adsorb or are capable of adsorbing additional water upon incorporation into a battery. Hence, the specification may be taken as

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intrinsic evidence that the electrodes would not accumulate additional water upon incorporation into a sealed battery. Accordingly, regardless of the interpretation of the instant claims (i.e., the water content measurements being taken before or after incorporation into a battery), the subject matter of claims 1 and 17 is still considered to be inherent in the Watanabe reference.

Conclusion

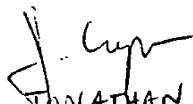
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (703) 308-4333. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 872-9310 (for non-final communications) or (703) 872-9311 (for after-final communications).

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

July 11, 2003


JONATHAN CREPEAU
PATENT EXAMINER
ART UNIT 1746